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PLASTIC APRON-GUTTER WILL IMPROVE GUM GRADES FOR NAVAL STORES PRODUCERS

BY

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ABSTRACT

Iron cups and gutters are the two major sources of contamination which de-grade gum and produces inferior rosin. The Georgia Forestry Commission and the U.S. Forest Service, USDA, recognized this problem and cooperated in re-

search to test new materials and improve the gum collection system. The one-piece plastic apron-gutter described herein will eliminate iron contamination and sulfuric acid will not attack the polyethylene material. The new gutters are easy to in-

stall on trees 9 inches DBH and larger. With reasonable care, the plastic system should last as long as the average turpentine face is worked and will always yield top grades of gum.

INTRODUCTION

The oleoresin, often called crude gum, extracted from living pines has been a periodic cash crop for many Georgians since 1800. In 1980 about 85 percent of the United States' production came from slash and longleaf pine forests in south Georgia.

Old production practices and the use of outdated supplies have lowered gum grades to the point that the industry is searching for new materials and better collection practices. The plastic apron-gutter described here will enable naval stores producers to make better grades and receive higher prices for their crude gum.

Nature has provided slash and longleaf pines found in the Southeast with the highest quality of any oleoresin in the world. Through distillation at processing plants, crude gum yields turpentine, a liquid, and rosin, a viscous sticky material. Rosin has the greater value. Processors buy crude gum by weight and grade, and grade is determined solely by color of the crude gum. Generally, a given grade

of crude gum will produce the same color grade of rosin. In both cases, pale colors are the highest in value and dark the lowest. Seven colors or grades are recognized: X (Extra), WW (water white) and WG (window glass) are pale colors; N (Nancy) is intermediate; and M (Mary), K (Kate) and I (Isaac) are dark colors. Turpentine is not distinguishable by color grade.

About 99-percent of the trees worked for gum in the United States are treated with a sulfuric acid paste or spray to stimulate gum flow. Cups, aprons and gutters of galvanized iron have been standard for collecting gum since about 1910. Since the introduction of acid stimulation in the 1950's, however, both gum producers and their field workers have observed that galvanized iron and sulfuric acid are not compatible. Too much sulfuric acid applied to the streak will run down the face onto the iron gutters and into collection cups. It destroys the protective zinc coating, exposing base iron; iron contaminants mix with the gum and

cause it to turn dark in color. The darker color reduces the grade of the gum and the rosin made from it. Only a small amount of iron rust from cups or gutters lowers rosin quality by three grades, and iron gutters deteriorate rapidly when sulfuric acid is used.

The Naval Stores Market News published by USDA Agricultural Marketing Service reported that less than 40 percent of the annual gum production for the crop year 1979-80 graded X, WW, and WG, the three top grades. To improve gum grades, the industry needs aprons and gutters that will resist the corrosive action of sulfuric acid and withstand abuse from installing and dipping.

The Gum Naval Stores Production Unit of the Southeastern Forest Experiment Station at Olustee, Florida, and the Research Division of the Georgia Forestry Commission have been experimenting since 1977 with thermoplastics in an effort to develop a one-piece plastic apron-gutter for use in commercial gum production.



Figure 1. -- One-piece plastic apron-gutter correctly installed on a 9-inch DBH tree showing position of the double-headed nails.

THE NEW PLASTIC

APRON-GUTTER

The new plastic apron-gutter, now in its second year of use, is made of polyethylene. It incorporates the geometric features of a center apron for balancing the cup and left and right gutter sections for channeling the gum from each side onto the apron and into the cup. The front cover shows the one-piece plastic apron-gutter correctly installed.

Sulfuric acid, in paste or solution, will not corrode or damage the polyethylene plastic apron-gutter. The molded apron-gutter is relatively tough. With normal dipping, handling, and abuse in the woods, the new apron-gutter should remain serviceable for at least 4 years.

INSTALLATION AND USE

The apron-gutter features a notch in the outer lip of the apron section, enabling the gutter to be flexed to fit trees of different sizes. Normally, six nails will attach the apron-gutter firmly to the tree if the bark has been properly smoothed with a rossing tool. Correct positioning of the nails for installation of the apron-gutter is shown in Figures 1 and 2.

To obtain a tight leakproof fit on large trees with nearly flat surfaces, and on trees with irregular surfaces, the outer ends of the gutter should be pulled down slightly and twisted toward the tree before nailing on the shoulders. It will fit trees 9 inches DBH and larger. A face up to 12 inches wide can be accommodated

(Fig. 3). The plastic in the apron-gutter is flexible, even in cold weather, and can be shaped to fit tightly on most cylindrical surfaces.

Polyethylene plastic apron-gutters have proven to be durable and reasonably tough. However, they can be punctured or split by careless installation or handling. These gutters contain pre-punched holes to prevent splitting and make driving of nails easy. Double-headed nails, especially those at each end, should not be driven too tight. Gum can be punched from the plastic apron-gutter and the unit elevated in the same manner as metal aprons and gutters (Fig. 4). The ends of the apron-gutter are capped to provide rigidity to the outer lips and to prevent gum from backing off the ends as waste.

AVAILABILITY AND

ECONOMIC IMPACT

The new plastic apron-gutter described here is manufactured and marketed by the Lerio Corporation of Valdosta, Georgia, and Mobile, Alabama. A total of 36,000 molded gutters were installed in 1980 by selected producers in Mississippi, Alabama, Florida and Georgia to test performance and durability. The plastic apron-gutter costs a few cents more than metal gutters, but the plastic system always yields top grade gum.

Gum flows uncontaminated from the pine tree, perfectly pure and clean. Con-

tamination and loss in value are caused by an outmoded and incompatible collection system. Plastic apron-gutters and cups will eliminate two major sources of the metal contaminates which degrade gum and produce inferior rosins. Naval stores producers should notice the economic impact of this new invention on market prices immediately.

The average price difference between WW and N gum is usually about \$12.00 per standard barrel. Based on the volume of gum produced by grades for the crop year, it is estimated that the production of X, WW, and WG gum could be increased by at least 25 percent.

SUMMARY

Georgia gum producers will find that plastic apron-gutters are tough, easy to install, and acid resistant. There will be no iron rust contaminates in gum from cups or gutters to lower grade and market price. With reasonable care, the one-piece plastic apron-gutter should last as long as the average turpentine face will be worked. Both producers and processors should profit from the development and use of this apron-gutter.



Figure 2. -- Cup should fit snug against tree and very tight under apron section.



Figure 3. --Cup should be level under apron section. The one-piece plastic apron-gutter will accommodate a stream 12 inches wide as shown on this 12-inch DBH tree.



Figure 4. -- One-piece plastic apron-gutter, plastic cup and nails are shown in the elevated position. Be sure outer ends are raised enough to cause gum to flow onto apron section.



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